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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,369	09/29/2003	Jer-Shen Maa	SLA 0775	5225

7590 08/19/2004

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EXAMINER
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NHU, DAVID

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/674,369

Applicant(s)

MAA ET AL.

Examiner

David Nhu

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10, 11, 13 and 14 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTIONS

### Specifications

1. Page 5, line 20, "the dose is in a range of between about  $1 \times 10^{16}$  to  $5 \times 10^{17}$ " should be -- the dose is in a range of between about  $1 \times 10^{16}$  to  $5 \times 10^{17}$  cm<sup>-2</sup> --

Also there is no description of (26) in figure 3.

### Claims Objection

2. claims 4, 12, "depositing a layer of SiGe to a thickness of between about 20 nm to 100 nm" should be -- depositing a layer of SiGe to a thickness of between about 20 nm to **1000** nm-- See page 7, line 10 in the specifications.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-4, 7 are rejected under 35 U.S.C. 102 (e) as being anticipated by Fitzgerald (6,750,130 B1).

**Regarding to claim 1**, Fitzgerald, (see figures 6, 7A-7D, col. 6, lines 14-67, col. 7, lines 1-21), teach a method of forming a silicon-germanium (SiGe) layer on an insulator, comprising: preparing a silicon substrate 700; depositing a layer of SiGe on the silicon substrate to form a Si/Si-Ge portion 702, 704; implanting hydrogen ions in the SiGe layer (see col. 6, lines 59-64); preparing an insulator substrate 706; bonding the Si/SiGe portion to the insulator substrate

with the SiGe layer in contact with the insulator substrate to form a bonded entity (see figure 7C); curing the bonded entity; and thermally annealing/heating the bonded entity to split the bonded entity into a Si/SiGe portion and a silicon-germanium-on-insulator portion and to relax the SiGe layer (see figure 7D).

Regarding claims 2-3, 7, Fitzgerald also teaches depositing an epitaxial silicon layer on the hydrogen implanted SiGe layer 702 before said bonding; and removing the SiGe layer from the SiGe-on-insulator portion after thermal annealing to form a relax silicon-on-insulator portion (see figures 7a-7d); preparing an insulator substrate includes a glass substrate; bonding the Si/SiGe portion to the insulator substrate with the SiGe layer in contact with the insulator substrate to form a bonded entity includes bonding by direct wafer/substrate bonding (see figures 7a-7d).

### ***Allowable Subject Matter***

5. *Claims 10-11, 13-14 are allowed.*

6. Claims 5-6, 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 10 includes allowable subject matter since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations.

Because Fitzgerald taken individually or in combination, does not teach curing the bonded entity at a temperature of between about 150 °C to 250 °C for a time of between about one hour to fourteen hours; thermally annealing/heating the bonded entity at a temperature of

between about 350 °C to 700 °C for a time of between about 30 minutes to four hours to split the bonded entity into a Si/SiGe portion and a SiGe-on-glass portion and to relax the SiGe layers.

### Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Fitzgerald'613, and '144, Wu'211, Liwa'769 are cited as of interest.
8. A shortened statutory period for response to this action is set to expired 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).
9. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

*The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.*

*Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.*

David Nhu 



August 17, 2004